

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 7,054,392 B2  
APPLICATION NO. : 10/006995  
DATED : May 30, 2006  
INVENTOR(S) : Chappaz

Page 1 of 6

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

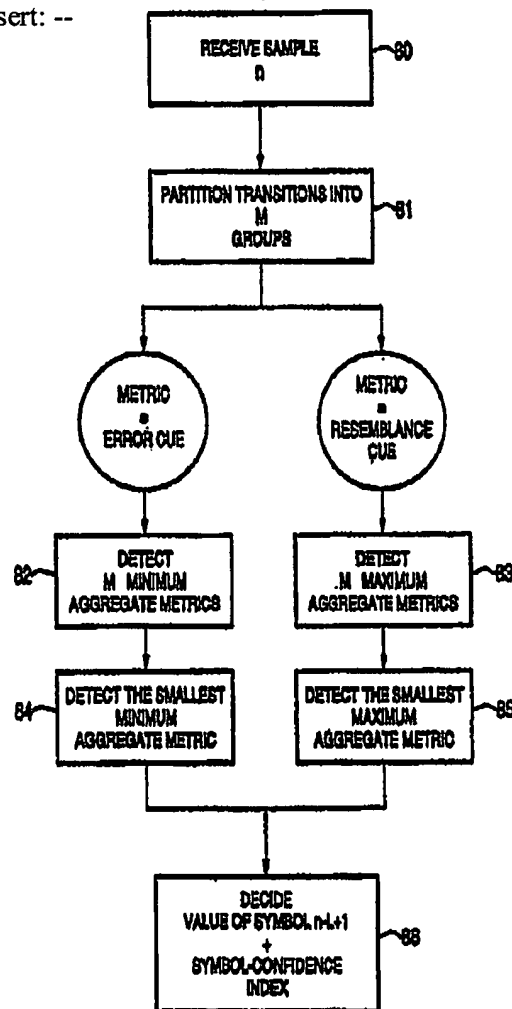
Delete Title page illustrating a figure, and substitute therefor, new Title page illustrating a figure. (attached)

Sheet 8 of 31

Delete: "Current drawing"

Insert: --

**FIG.8**



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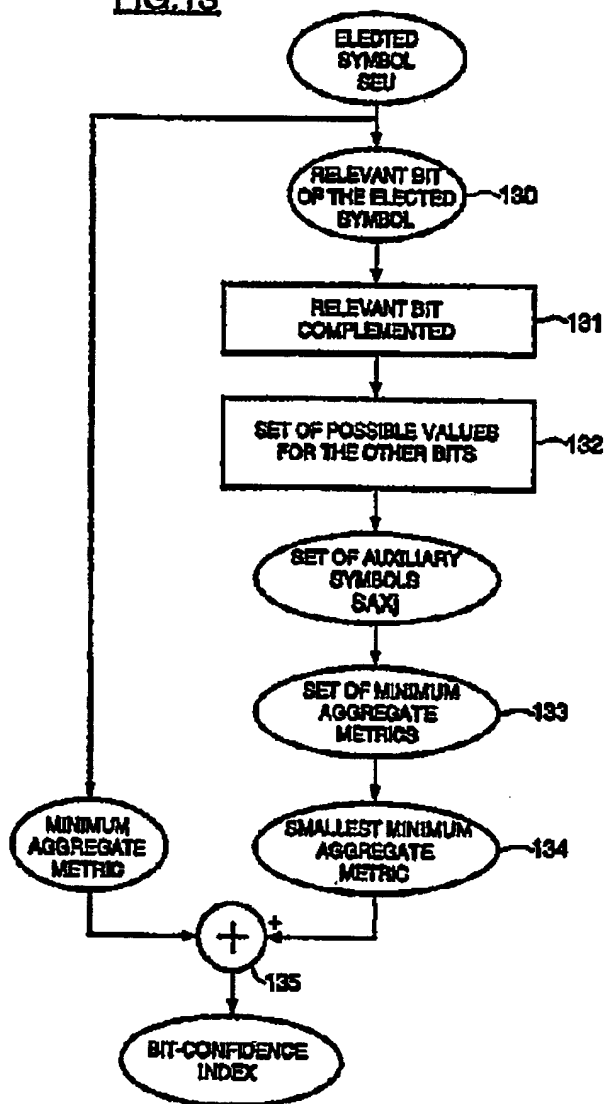
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Sheet 13 of 31

Delete: "Current drawing"

Insert: --

**FIG.13**



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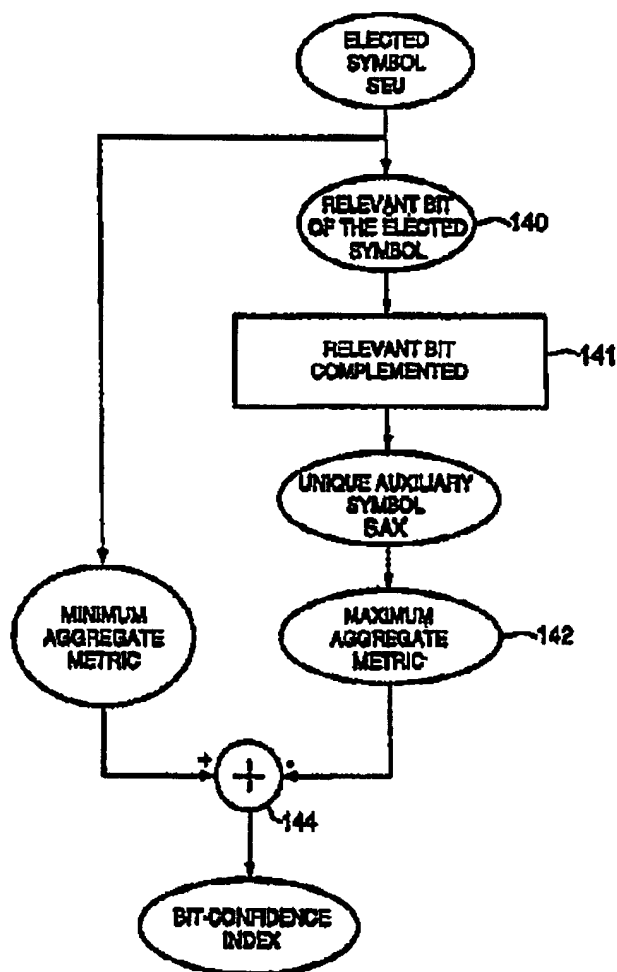
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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

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Delete: "Current drawing"  
Insert: --

**FIG.14**



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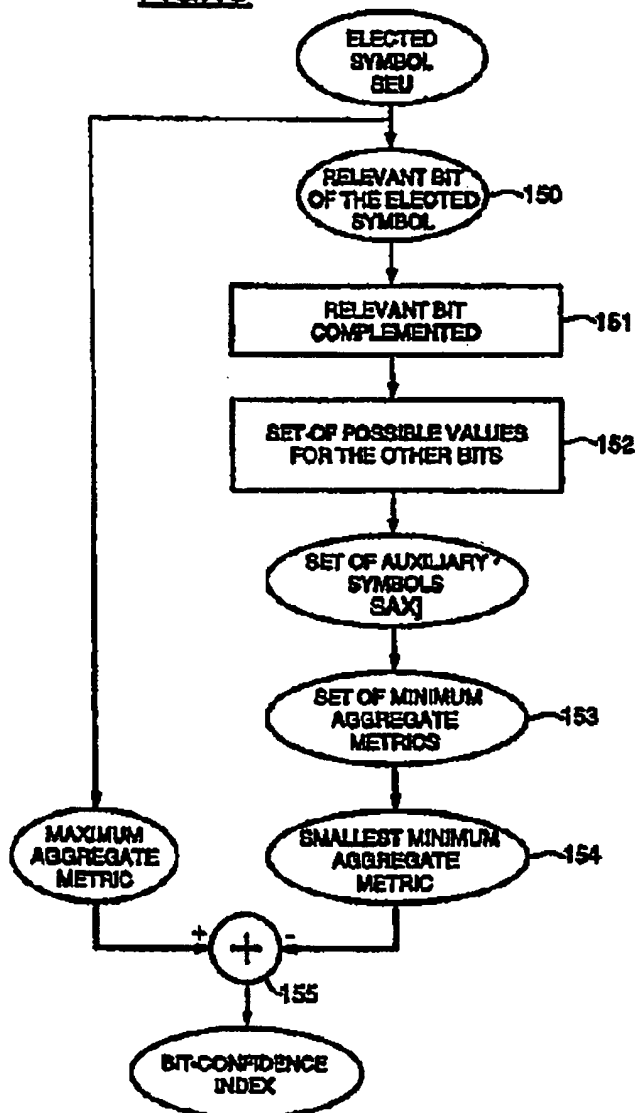
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Sheet 15 of 31

Delete: "Current drawing"

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**FIG.15**



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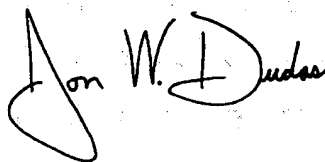
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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 13, Line 24	Delete: "resemblance, information" Insert: -- resemblance information --
Column 14, Line 17	Delete: "ETGN" Insert: -- ETG <sub>n</sub> --
Column 15, Line 54	Delete: "SELL" Insert: -- SEL1 --
Column 15, Line 56	Delete "MO" Insert: -- M0 --
Column 15, Line 67	Delete: "SELL" Insert: -- SEL1 --
Column 30, Line 64	Delete: "decision by" Insert: -- decision, by --
Column 31, Line 38	Delete: "45" Insert: -- 46 --

Signed and Sealed this

Thirteenth Day of March, 2007

A handwritten signature in black ink, reading "Jon W. Dudas". The signature is stylized with a large, looped initial "J" and a cursive "Dudas".

JON W. DUDAS  
*Director of the United States Patent and Trademark Office*

(12) **United States Patent**  
**Chappaz**

(10) Patent No.: **US 7,054,392 B2**  
(45) Date of Patent: **May 30, 2006**

(54) **PROCESS AND DEVICE FOR ESTIMATING THE SUCCESSIVE VALUES OF DIGITAL SYMBOLS, IN PARTICULAR FOR THE EQUALIZATION OF AN INFORMATION TRANSMISSION CHANNEL IN MOBILE TELEPHONY**

(75) Inventor: **David Chappaz, Saint Julien en Genevois (FR)**

(73) Assignee: **STMicroelectronics N.V., Amsterdam (NL)**

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 792 days.

(21) Appl. No.: 10/006,995

(22) Filed: Dec. 3, 2001

(65) **Prior Publication Data**  
US 2002/0126775 A1 Sep. 12, 2002

(30) **Foreign Application Priority Data**  
Dec. 4, 2000 (EP) ..... 00125395  
May 29, 2001 (EP) ..... 01112095

(51) Int. Cl.  
**H03D 1/00** (2006.01)  
**H04L 27/06** (2006.01)

(52) U.S. Cl. .... 375/341; 375/262; 375/265;  
714/792; 714/795; 714/796

(58) Field of Classification Search ..... 375/229-233,  
375/262, 265, 285, 227, 341, 346, 350; 708/300,  
708/319-323; 714/792, 795, 796  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

5,144,644 A 9/1992 Bonh ..... 375/96  
5,375,129 A 12/1994 Cooper ..... 371/43  
6,347,125 B1 \* 2/2002 Deat ..... 375/341  
6,622,283 B1 \* 9/2003 Cohen ..... 714/794  
6,707,849 B1 \* 3/2004 Zeng et al. .... 375/233  
6,829,297 B1 \* 12/2004 Xia et al. .... 375/232

**FOREIGN PATENT DOCUMENTS**

EP 0858196 8/1998

**OTHER PUBLICATIONS**

Mueller et al., "Reduced-State Soft-Output Trellis-Equalization Incorporating Soft Feedback", Global Telecommunications Conference (Globecom), US, New York, IEEE, Nov. 18, 1996, pp. 95-100, XP000742133.

\* cited by examiner

*Primary Examiner*—Jean-B. Corrieus  
(74) *Attorney, Agent, or Firm*—Lisa K. Jorgenson; Allen, Dyer, Doppelt, Milbrath & Gilchrist, P.A.

(57) **ABSTRACT**

A process for estimating successive values of digital symbols which can each take M different possible values, on the basis of the successive values of digital samples each of which results from the combination of at most L successive symbols. This process includes a stage by stage progression through a trellis of the Viterbi type with  $M^L$  states, with k being less than or equal to L-1. All the stages are respectively provided with aggregate metrics.

60 Claims, 31 Drawing Sheets

